

January 2014

MATH 20/20

A NEW LENS FOR MATHEMATICS TEACHING AND LEARNING



MCESA

Maricopa County Education Service Agency

Rodel FOUNDATION
OF ARIZONA

Math 20/20 VISION

Strategy

Maricopa County Education Service Agency, in partnership with the Rodel Foundation of Arizona, seeks to transform the quality of mathematics education throughout Maricopa County utilizing a powerful professional learning model designed to innovate and sustain the teaching and learning of mathematics. Based on *Arizona's College and Career Ready Standards for Mathematics*, this model impacts school systems, including administrators, teachers, and students, as they pursue excellence in mathematics teaching and learning.

*Your solution to
implementing the
Arizona College
Career Ready
Mathematics
Standards*



MCESA

Maricopa County Education Service Agency

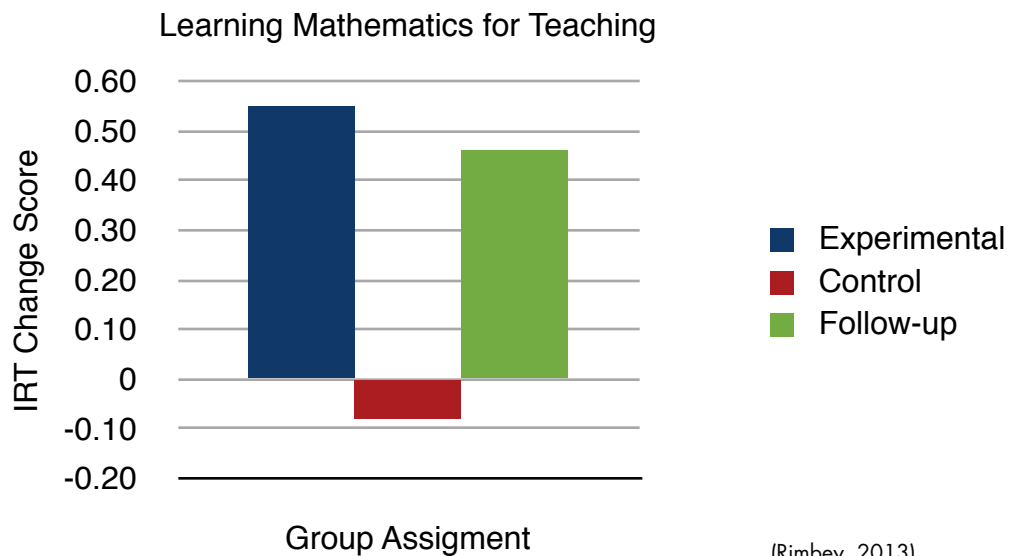


FOUNDATION
OF ARIZONA

Math 20/20

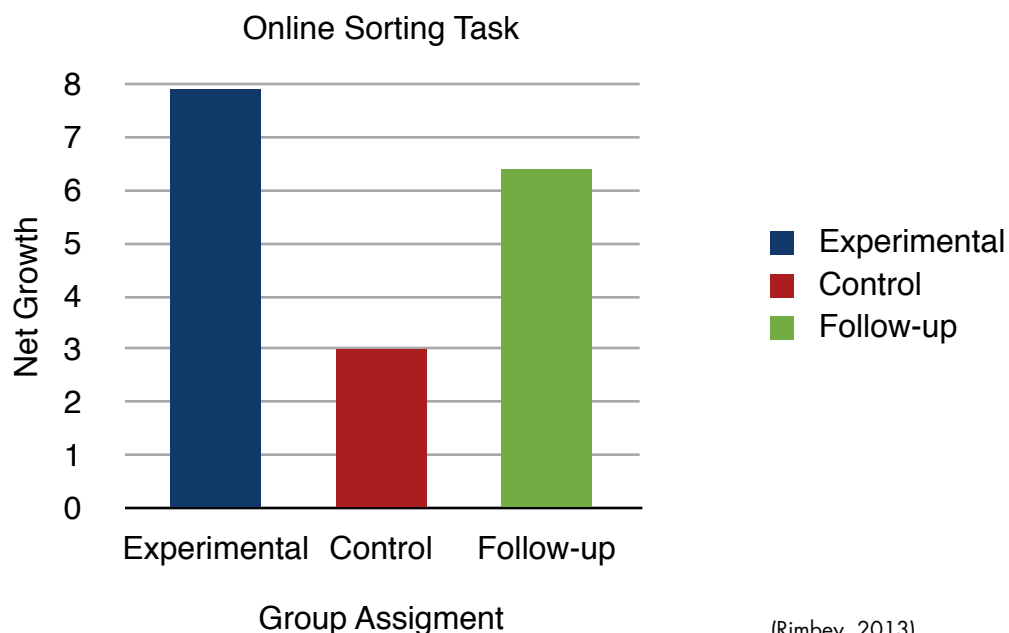
Math 20/20 expands and promotes a systemic approach to transforming the teaching and learning of math based on Arizona's mathematics standards. This unique combination of intensive professional learning for teachers, teacher leaders, and administrators accompanied by ongoing support and student materials offers school systems the opportunity to embed quality mathematics teaching into the system's culture. In a recent study, Math 20/20 impacted teacher content knowledge, knowledge of the Standards, and classroom practice.

Figure 1.
Changes in
Teacher Content
Knowledge



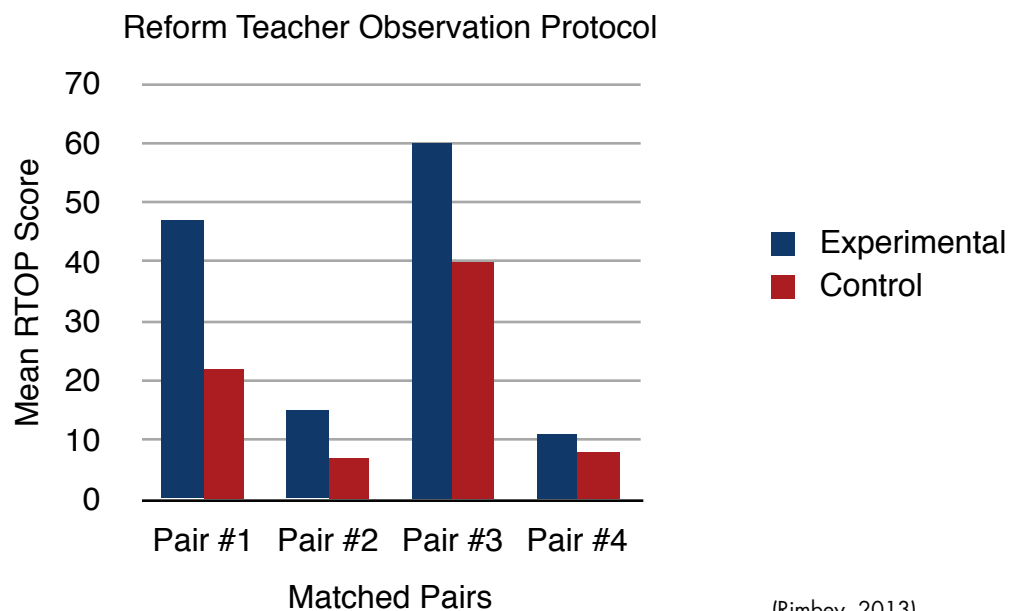
(Rimbey, 2013)

Figure 2.
Changes in
Teachers'
Knowledge of
the Standards



(Rimbey, 2013)

Figure 3.
Changes in
Classroom
Practice

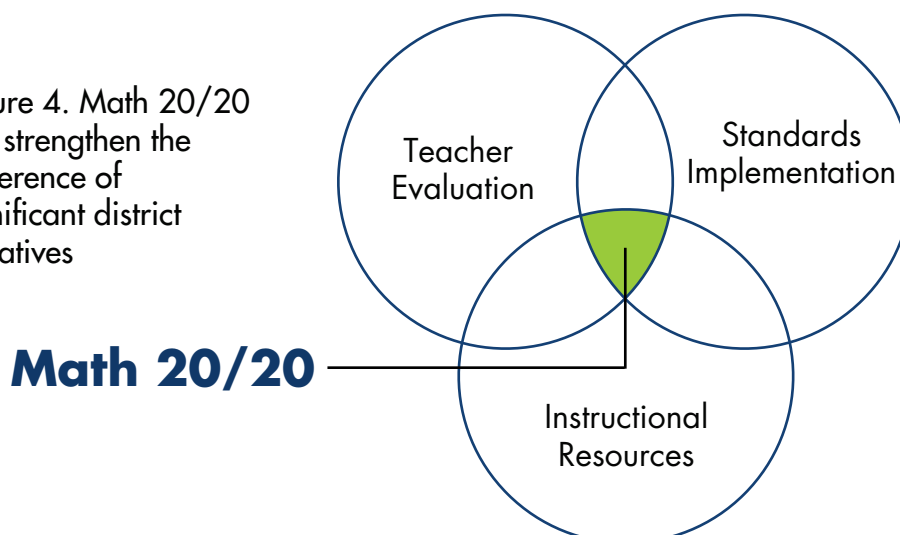


Benefits To Your School System

As an administrator, Math 20/20 gives you the peace of mind that the shifts required to implement *Arizona's College and Career Ready Standards for Mathematics* will take place throughout your system. Your teachers, teacher leaders, and school administrators will participate in intensive professional learning that will impact every level of your system, with the ultimate goal of ensuring that every student learns and values math as a tool for life. Each Math 20/20 cohort is customized to ensure alignment to the district teacher evaluation and adopted instructional resources. Furthermore, MCESA will support the district in planning for the ever-present issue of teacher turn-over.

A systemic solution for all teachers within a grade level and throughout the district

Figure 4. Math 20/20 will strengthen the coherence of significant district initiatives



PROFESSIONAL LEARNING MODEL

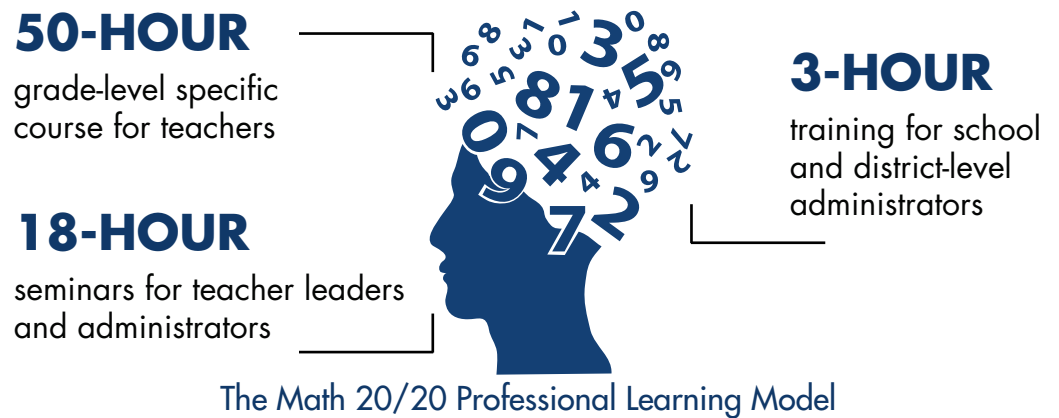
Math 20/20 provides a comprehensive, sustained, and intensive approach to improving teachers' and leaders' effectiveness for improving math teaching and learning.

Math 20/20 builds on the premise that teacher quality is the number one indicator for student success. Based on Arizona's Mathematics Standards, the intensive PD includes 50 hours of training and development for teachers along with companion training for coaches and school administrators. This training focuses on grade-level cohorts across each district, providing an intensive look at the standards for content and math practices, centering on ensuring educators at all levels examine their values, beliefs, and behaviors regarding math teaching and learning. The ultimate goal is to infuse a mindset of excellence in mathematics instruction within each education system.



Figure 5. An Intensive Professional Learning Approach

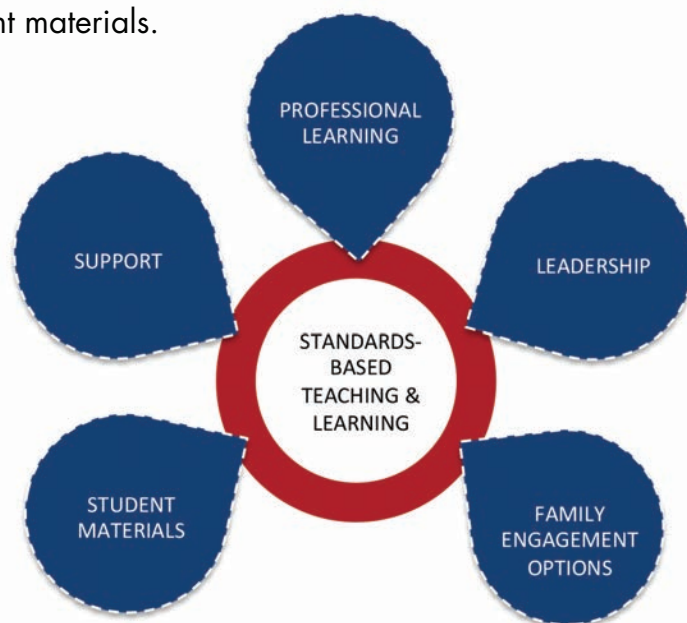
Figure 6.
Systems Job
—Embedded
Professional
Learning



Professional Learning Model Components

- Teachers attend a 50-hour grade-level specific course (36 hours of workshop time and 14 hours of independent learning time).
- Coaches and teacher leaders attend companion training designed for those working across multiple grade levels (18 hours); this group may also attend the teacher training.
- School- and district-based administrators attend companion training focused on supervision and evaluation on mathematics teaching and learning (3 hours per semester); this group may also attend teacher and/or coaches training.
- District-level administrators collaborate with the Math 20/20 consultant to customize the training to the district's resources.
- Superintendents establish Math 20/20 as a district-wide initiative.
- All stakeholders participate in the sustainability model that includes family engagement opportunities, leadership support, teacher workshops, school-level support, and student materials.

Figure 7. Year 2+
Sustainability



District Planning Logistics

The following items should be considered when planning to implement Math 20/20.

1. **Collective Participation.** Because the focus is system-wide change in the teaching and learning of mathematics, all district teachers and administrators across a single grade level must participate concurrently, even when participating in the “Centralized Professional Learning Model” setting (see page 10). All grade-level teachers should attend the same session at the scheduled time. Furthermore, all principals from a single system should attend the same administrator sessions at the same time.
2. **Learning Environment.** The interactive nature of this course requires that the workshop setting be conducive to movement, interaction, and technology-based delivery (document camera, projector, screen, etc.).
3. **Duration.** Unless otherwise negotiated, each teacher-level course will include six 6-hour sessions spaced approximately three weeks apart. The optimal time span between the teacher sessions is three weeks. This may be occasionally shifted to two weeks or to four weeks, noting that too little time does not facilitate implementation, and too much time leads to lack of retention and coherence. In addition, each participant will complete approximately 14 hours of “homework” through professional reading and classroom implementation tasks.

MCESA Professional Learning Customization

1. **Content Focus.** The goal of the initial intensive professional learning module is to focus on the specific content and pedagogy teachers need to embed into their practice for successful implementation of Arizona’s Mathematics Standards.
2. **Coherence.** To facilitate implementation, every effort will be made to customize the sessions based on the district-adopted resources including math textbooks and other math resources, pacing guides, curriculum maps, and teacher evaluation instruments. In addition, the materials and activities occurring during the workshops should provide opportunities for participants to connect ideas within and across grade levels and content areas.



Sample Schedules

The sample schedule below illustrates the six-day model for the **Math 20/20 Professional Learning Model**. This schedule may be altered in collaboration with MCESA. Note that all sessions should take place during working hours. Sessions should not be scheduled in the evening, on weekends, or during the summer.

Sample Schedule			
Day	Date	Content	Homework
1	August 27	Standards Overview; Algebraic Thinking (OA)	Professional Reading Student Tasks
2	September 17	Mathematical Practices, part 1; Place Value (NBT.A)	
3	October 8	Mathematical Practices, part 2; Multi-digit Operations (NBT.B)	
4	October 29	Fractions (NF)	
5	November 19	Measurement and Data (MD)	
6	December 10	Geometry (G)	

MODEL For System-Wide Math Improvement



Teachers and leaders need opportunities to learn the content, pedagogy, and leadership strategies for implementing *Arizona's College and Career Ready Standards for Mathematics*.

YEAR 1

ACTIVITIES

Intensive Professional Learning Model

OUTPUT

- Participants improve their knowledge of grade-level standards, math content, and pedagogy
- Participants are equipped to implement math standards with appropriate content and pedagogy
- Teacher leaders are equipped to support teachers in standards implementation
- Administrators are equipped to supervise and evaluate standards implementation
- District administrators and resources are equipped to support standards implementation

YEAR 2+

Sustainability Model

- School-wide improvement and refinement standards-based instruction through meetings, reflections, and workshops
- Teachers improve their content knowledge by examining standards-based student tasks
- Students increase their opportunity to learn using standards-based materials

GOAL

Through a systemic implementation of Math 20/20, student achievement in mathematics will increase, and students will value math as a tool for life.



Timeline

Professional Learning Model	
Year 1	Activities
February–March	Attend information meetings
April	Finalize inter-governmental agreements
May	Schedule SY2015 professional learning
	Submit preliminary lists of participating teachers, teacher leaders, and principals
July	Make financial arrangements
August–December	Participate in teacher courses Monitor and support teacher implementation of new learning Participate in principal meetings Submit teacher and student assessment data

Cost Structure

SY2014

Math 20/20 is designed to support simultaneous professional learning systemically across a grade level within an LEA. Professional learning courses and follow-up support are provided at a site within the LEA. For smaller LEAs, it may be more economical to combine with one or more LEAs and offer the professional learning at a centralized location and select the centralized per participant option.

The following analysis includes the costs associated with the Math 20/20 during the 2014-2015 year.

YEAR 1

Option A



Field-Based Professional Learning Model:

Single grade level, 20-30 teachers per group

Training

\$5,900 per cohort

- Collaborate with district administrators
- Deliver 36 hours of instruction to teachers
- Support teachers in their between-session work
- Present administrator meetings

Teacher Materials

\$200 per teacher

- Binder materials
- Van de Walle book
- SMP posters
- Classroom manipulatives and non-consumables

Online Access to Student Materials

\$250 per school

OR

Option B



Centralized Professional Learning Model:

\$800 per participant attending at MCEA site or other LEA site

- Collaborate with district administrators
- Deliver 36 hours of instruction to teachers
- Support teachers in their between-session work
- Present administrator meetings

Teacher Materials Included

YEAR 2



Sustainability Model:

Cost per school per year (regardless of size)

Consultant/Liaison

\$1,700 per school

- Add \$300 if greater than 20 teachers
- Four visits per school per year
- Two teacher workshops per year
- Two principal meetings per year (centralized)
- License fee of \$250 per school per year is included in costs



